

REMARKS

This response is being filed in reply to the Office Action having a mailing date of February 23, 2005. Claims 1-24 are pending for examination and consideration.

In the Office Action, the Examiner indicated that claims 6, 11, 17, 19, and 23-24 would be allowable if rewritten in independent form to include the limitations of their respective base claims. The applicants thank the Examiner for providing this indication of allowable subject matter.

In the Office Action, claims 1, 5, 7-8, 12-15, 18, and 20-22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Knapp (U.S. Patent No. 4,241,316). Claims 2-4, 9-10, and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Knapp. More specifically with regards to Knapp, the Examiner stated on page 2 of the Office Action that the transistor 2 of Knapp can be read as a load element (DMOS transistor), per column 9, lines 1-13 of Knapp. For the reasons set forth below, the applicants respectfully disagree with the rejections, and request that all pending claims be allowed.

A disclosed embodiment will now be discussed in comparison to the applied references. Of course, the discussion of the disclosed embodiment, and the discussion of the differences between the disclosed embodiment and subject matter described in the applied references, do not define the scope or interpretation of any of the claims. Instead, such discussed differences are intended to merely help the Examiner appreciate important claim distinctions discussed thereafter.

One embodiment of the present invention provides a different aspect and application of the cascode architecture. An embodiment optimizes the driving element (*e.g.*, active element) and load element in order to increment at the same time the cutoff frequency and breakdown voltage. In this manner, it is possible to improve the power gain for radio frequency (RF) large signals, which is fundamental for RF power amplifier applications. *See, e.g.,* page 3, lines 6-11 of the present application.

One way to obtain these performances integrated on the same silicon die is to use a smart power mixed technology, where high speed elements (for example VLSI CMOS or HF bipolar and power devices such as for example DMOS with high voltage and high current capabilities) are present on the same silicon wafer. In such an embodiment, the DMOS is used

as the load element in order to withstand the voltage. Moreover, since the DMOS has a high current density capability, it is possible to keep small dimensions without increasing output capacitance, which is useful for RF applications.

Knapp, in contrast to what the applicants have disclosed, relates to a completely different type of circuit and application. In Knapp, two transistors, such as a FET, MOS, or BJT are connected as cascoded elements in a well known electronic design technique that is used to improve the transconductance and output conductance (respectively g_m and g_o). See, e.g., column 12, lines 38-61 of Knapp. Consequently, in Knapp and the prior art with respect to a single transistor amplifier, the cascode architecture provides high voltage gain for AC small signals.

Moreover in Knapp, the DMOS or other transistor 2 is not being used as a load element, as the Examiner has suggested in the Office Action. For example, column 9, lines 1-8 of Knapp clearly states that the DMOS transistor is used as a driver. Thus, the DMOS of Knapp is clearly not the load that is being driven.

As explained above in the present application, use of the DMOS as the load element by the applicants provides an architecture wherein the power gain for large signals for RF power amplifier applications is improved, wherein the DMOS can withstand the voltage, has high cutoff frequencies, has high breakdown voltage values, has high transconductance values in the saturated area, low on-state resistance value, and has small dimensions without increasing output capacitance. See, e.g., page 5, lines 9-20 of the present application. The circuitry of Knapp is used differently and provides different results.

Based on the above discussion, it is believed that independent claims 1, 7, 13, 18, and 21 in their present form are allowable over Knapp and the other cited references. Claim 1 recites that the load element includes a DMOS transistor. Claim 7 recites a load element having first, second, and third terminals, and which is coupled to an active element in cascode configuration.

Claim 13 is directed towards a power amplifier usable in radio frequency applications, the power amplifier including a transistor load element. Claim 18 recites a transistor load element, as does claim 21. Because all of the independent claims recite a transistor load element (or in the case of claim 7, a load element having first, second, and third

terminals), these independent claims are allowable. Knapp is completely silent with regards to a transistor, such as a DMOS transistor being used as a load element. Instead, Knapp uses its transistors as part of a driving circuit.

Overall, none of the references singly or in any motivated combination disclose, teach, or suggest what is recited in the independent claims. Thus, given the above amendments and accompanying remarks, the independent claims are now in condition for allowance. The dependent claims that depend directly or indirectly on these independent claims are likewise allowable based on at least the same reasons and based on the recitations contained in each dependent claim.

If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to the allowability of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 622-4900.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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